CLAIMS

What is claimed is:

1. A sensor for detecting biological molecules, said sensor comprising:

a substrate;

an electrode having the capacity to bind a preselected biological molecule, said electrode being between about 10^{-9} and 10^{-10} meters in height and width.

2. The sensor recited in claim 1, wherein said electrode is a plurality of electrodes.

3. The sensor recited in claim 2, wherein each of said electrodes has an identical chemical composition.

4. The sensor recited in claim 2, wherein at least one of said electrodes has a chemical composition which is different than the other of said electrodes.

5. The sensor recited in claim 1, wherein said electrode has an outer coating.

6. The sensor recited in claim 2, wherein each of said electrodes has a chemical coating.

7. The sensor recited in claim 6, wherein each of said coatings has the same chemical composition.

8. The sensor recited in claim 6, wherein at least one of said coatings is different than the other of said coatings.

9. The sensor recited in claim 2, wherein the height of at least one of said electrodes is different that the height of the other of said electrodes.

10. The sensor recited in claim 2, wherein the width of at least one of said electrodes is different that the widths of said other electrodes.

11. The sensor recited in claim 2, wherein said electrodes are spaced laterally from one another on said substrate.

12. The sensor recited in claim 2, wherein said electrodes are arranged in clusters on said substrate.

13. The sensor recited in claim 2, wherein the electro-chemical properties, width and spacing of said electrodes complement and bind a site on said biological molecules.

17 ~~14~~. The sensor recited in claim 1, wherein said electrode is connected to at least one electrically conductive nanowire.

15. The sensor recited in claim 2, wherein said electrodes are connected to nanowires.

18 ~~16~~. The sensor recited in claim 1, further comprising an interface connecting said sensor to a control system.

13 ~~17~~. The sensor recited in claim 12, wherein said clusters are spaced to form an array.

19 ~~18~~. The sensor recited in claim 1, wherein said biological molecules are proteins.

20 ~~19~~. A sensor for detecting proteins, said sensor comprising:

a micro-capillary tube;

a plurality of electrodes disposed in said tube, said electrodes having the capacity to bind a preselected protein, said electrodes being between about 10^{-9} and 10^{-10} meters in height and width.

21 ~~20~~. The sensor recited in claim ~~19~~ 20, further comprising a microcontroller.

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21. The sensor recited in claim 20, further comprising a system to regulate the temperature of said sensor.

22. A sensor for detecting biological molecules, said sensor comprising:

a substrate;

a micro cantilever array on said substrate;

at least one electrode disposed on at least one of said micro cantilevers.

23. The sensor recited in claim 22, further comprising a laser for determining the concentration of biological molecules bound to said electrode.

24. The sensor recited in claim 23, further comprising a piezoelectric detector for detecting the concentration of biological molecules bound to said electrode.

25. A method of sequencing nucleic acids, comprising the steps of:

providing a sensor, said sensor having a substrate on which plurality of electrodes are disposed, said electrodes each being between about 10^{-9} and 10^{-10} meters in height and width;

contacting said electrodes with a solution containing nucleic acids;

said electrodes having the capacity to bind at least some of said nucleic acids.

26. The method recited in claim 25, wherein said nucleic acids are DNA and wherein said electrodes are spaced apart from one another to complement and bind to DNA base pairs of a linear DNA molecule.

27. The method recited in claim 25, wherein said sensor includes a microtube in which said electrodes are disposed.

28. The method recited in claim 27, further comprising a flow control system and a laser detector.

29. The method recited in claim 25, further comprising a microcontroller and a display.

30. The method recited in claim 25, wherein said nucleic acids are RNA.

31. The method recited in claim 2, further comprising a support structure for said substrate, said support structure being adapted to be received in a x-y fluorescent laser reader.

32. A silicon chip to detect individual proteins comprising at least one sensor manufactured with Angstrom level precision where the surface of the sensor complements exactly the three dimensional shape of a given protein.

33. The invention recited in claim 32, wherein the sensor is made of a single metal.

34. The invention recited in claim 32, wherein the sensor is made of different metals.

35. The invention recited in claim 32, wherein the sensor forms a protein-specific receptor.

36. The invention recited in claim 32, wherein the sensor is made from information derived from x-ray diffraction studies.

37. The invention recited in claim 32, wherein the sensor is made from information derived from nuclear magnetic resonance studies.